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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/939,106	08/24/2001	Stepan Sokolov	SUN1P842/P6723	3355
22434	7590	08/27/2004	EXAMINER	
BEYER WEAVER & THOMAS LLP P.O. BOX 778 BERKELEY, CA 94704-0778			GORDON, CARLENE MICHELLE	
			ART UNIT	PAPER NUMBER
			2124	
DATE MAILED: 08/27/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/939,106	SOKOLOV, STEPAN	
	Examiner	Art Unit	
	Carlene Gordon	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers



- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02/20/2002</u>  | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

1. This action is responsive to the application filed on August 24, 2001.

Claims 1-20 are pending in the application.

Drawings

2. Figure 1A should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. 37 CFR 1.84(p)(5) states:

(5) Reference characters not mentioned in the description shall not appear in the drawings. Reference characters mentioned in the description must appear in the drawings.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

Fig. 2B, reference numbers 220 and 232.

Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to under 37 CFR 1.83(a) because they fail to show an arrow in Figure 9B designating the flow of the instructions 920 to the instruction generator 902 as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing.

MPEP § 608.02(d). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement

sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-12 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. A simple amendment will overcome this rejection.

The language of claims 1 and 9 raise a question as to whether the claims are directed merely to an abstract idea that is not tied to a technological machine which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101. The Office interprets the invention of the claim as an abstract idea.

Claims 2-12 are rejected under the same rationale as claim 1 and 9 because they are dependent claims of claim 1 or claim 9.

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Claim 1:

In a Java computing environment, a Java macro instruction **on a computer readable medium** representing:

a sequence of Java Bytecode instructions consisting of a Java Getfield Bytecode instruction immediately followed by a Java Astore Bytecode instruction,

wherein said Java macro instruction can be executed by a Java virtual machine operating in said Java computing environment, and

wherein, when said Java macro instruction is executed, the operations that are performed by said conventional sequence of Java Bytecode instructions are performed.

Claim 9:

In a Java computing environment, a Java macro instruction **on a computer readable medium** representing:

a sequence of Java Bytecode instructions consisting of an inventive Java Getfield Bytecode instruction immediately followed by an inventive Java Astore Bytecode instruction,

wherein said Java macro instruction can be executed by a Java virtual machine operating in said Java computing environment, and

wherein, when said Java macro instruction is executed, the operations that are performed by said sequence of Java Bytecode instructions are performed.

8. To expedite a complete examination of the instant application the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-8, 10 -12, and 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 1 recites the limitation "said conventional sequence" in line 10. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation "the Java Bytecode verification phase" in line 18. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the virtual machine instruction" in line 25. There is insufficient antecedent basis for this limitation in the claim.

Claim 13 recites the limitation "said conventional sequence" in line 12. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "the Java Bytecode verification phase" in line 21. There is insufficient antecedent basis for this limitation in the claim.

The rejection of the base claims is necessarily incorporated into their dependent claims.

The limitations "A Java macro instruction" in claims 2-8 and 10-12, and "A computer readable media" in claims 14-20 is unclear as to whether or not these elements refer to the "instruction" and "media" in base claims 1, 9, and 13.

12. The term "inventive" in claim 9 is a relative term, which renders the claim indefinite. The term "inventive" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention. The inventive Java Getfield Bytecode instruction and the inventive Java Astore Bytecode instruction are rendered indefinite by the use of the term inventive. For the purpose of interpreting the claim in order to review applicable prior art, the Examiner interprets the inventive instruction Astore to represent a virtual machine instruction suitable for storing values into arrays as taken from the applicant's specification (pg. 19, paragraph [0054], lines 1-2), in which this interpretation does not afford distinction from a conventional Astore instruction of claim 1. Also, the inventive instruction Getfield is not defined by the applicant to be distinct from the conventional instruction Getfield, and will be interpreted to be the same as the Getfield instruction of claim 1.

13. The following is a quotation of the fourth paragraph of 35 U.S.C. 112:

Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

14. Claims 2 and 14 are rejected under 35 U.S.C. 112, fourth paragraph, as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 2 recites the limitation, "Java macro instruction consists of a *conventional* Java Getfield Bytecode instruction immediately followed by a *conventional* Java Astore Bytecode instruction" (emphasis added). The Office acknowledges the difference in wordings of claim 1 and claim 2 by the placement of the word "conventional" as in claims 2; however, from the claim language and written description, the Office is not able to determine the difference in scope of claims 1 and 2, as to how "conventional" Getfield and Astore instructions are different from "Getfield" and "Astore" instructions of claim 1.

Claim 14 is rejected to under the same rationale as claim 2 for failing to further limit the subject matter of claim 13.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 1-3, 9, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritchey ("Java!"), hereafter "**Ritchey**", and further in view of Microsoft Press (Microsoft Press Computer Dictionary Third Edition), hereafter "**Microsoft**".

17. **As to claim 1:**

Ritchey discloses a sequence of Java Bytecode instructions representing a Java Getfield Bytecode instruction immediately followed by a Java Astore Bytecode instruction (pg. 331, Fig. 14.1).

Ritchey discloses wherein said Java instruction can be executed by a Java virtual machine operating in said Java computing environment (code is fed to a compiler that generates Java bytecode for a Java virtual machine pg. 326, paragraph 2, lines 1-3; pg. 331, Fig. 14.1). Ritchey does not explicitly disclose that the Java instruction is a macro.

However, Microsoft discloses that a macro can be defined that consists of several statements or instructions (pg. 295, col. 1 – macro assembler). This macro name can be used later in the code (pg. 295, col. 1, -macro assembler) and be replaced by the actual instructions they represent (pg. 295, col. 1, lines 3-4).

Ritchey teaches the generation of Java byte code instructions in a Java Virtual Machine environment, while Microsoft teaches the replacement of instructions by a macro. One of ordinary skill in the art at the time of the applicants invention would have been motivated to combine the sequence of conventional Java instructions as disclosed Ritchey to be represented by a macro instruction as disclosed by Microsoft, in the Java Virtual Machine computing environment clearly taught by Ritchey. One would have been motivated to do so because a macro can save time by replacing a lengthier set of instructions with a shorter version as suggested by Microsoft (pg. 294, col. 2, -macro). Furthermore, as taught by Microsoft, using a macro avoids having to rewrite the statements (instructions) as explicitly taught by Microsoft (pg. 295, col. 1, -macro assembler). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to rewrite the sequence of instructions in the Java computing environment of Ritchey into a macro as taught by Microsoft.

18. As to claim 2:

Rejection of claim 1 is incorporated and further, the term "conventional" is interpreted as "based on general practice", and the instructions as disclosed by Ritchey are conventional.

19. As to claim 3:

Rejection of claim 1 is incorporated and further, in the method disclosed by Ritchey and modified by Microsoft, the Java macro is generated during the Java

Bytecode verification phase, wherein the bytecode will be verified (checked for the sequence of instructions) to create the Java macro instruction.

20. **As to claim 9:**

Claim 9 recites limitations already discussed in connection with claim 1 therefore; claim 9 is rejected under the same rationale as claim 1. For purposes of examination the term an "inventive macro instruction" is interpreted as a macro instruction.

21. **As to claim 13:**

The limitations of claim 13 have already been addressed in connection with claim 1 above.

22. **As to claim 14:**

Rejection of claim 13 is incorporated and further see rejection of claim 2.

23. **As to claim 15:**

Rejection of claim 14 is incorporated and further claim 15 see rejection of claim 3.

24. Claims 4-5, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritchey and Microsoft as applied to claim 1 above, and further in view of Augusteijn et al. (U.S. Patent No. 6,292,883), hereafter "**Augusteijn**".

25. **As to claim 4:**

Rejection of claim 1 is incorporated, and further Ritchey discloses the Java instruction represented as a stream (pg. 336 "instruction set for the JVM", "instruction consists of an opcode... operand"; pg. 328 "opcodes... operands exist as a stream"), wherein the opcode contains the code portion (pg. 328 "opcode – a specific a recognizable command"), and the operand contains the data portion (pg. 328 "operand – the data needed to complete the opcode") of the Java instruction.

The teachings of Ritchey and Microsoft do not explicitly disclose wherein said Java virtual machine internally represents Java instructions as a pair of streams. However, Augusteijn teaches virtual machine instructions represented as a pair of streams (col. 7, lines 1-5, "Harvard architecture").

Augusteijn is analogous art because it deals with the applications of virtual machine instructions. One of ordinary skill in the art at the time of the invention would have been motivated to optimize the virtual machine to represent Java instructions as a pair of streams as exemplified by the Harvard architecture in which instructions ("commands or opcodes", Ritchey) are separate from the data ("operands", Ritchey) as taught by Augusteijn; and would have been motivated to combine this with the invention of Ritchey and Microsoft to represent code as segregated from data in order to make the virtual machine more efficient and faster by bypassing the step of having to extract the code from the data.

26. **As to claim 5:**

Rejection of claim 4 is incorporated, and further Augusteijn discloses wherein said pair of streams includes a code (col. 7, line 5 "instructions") stream and a data (col. 7, line 5 "data") stream,

wherein said code stream is suitable for containing a code portion (instructions are interpreted by the code or commands, as illustrated above) of said Java macro instruction, and

wherein said data stream is suitable for containing a data portion of said Java macro instruction (data, as illustrated in above).

27. **As to claim 16:**

Rejection of claim 15 is incorporated and further see rejection of claim 4.

28. **As to claim 17:**

Rejection of claim 16 is incorporated and further see rejection of claim 5.

29. Claims 6-8, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritchey, Microsoft, and Augusteijn as applied to claim 5 above, and further in view of Goss et al. (U.S. Patent No. 4,667,290), hereafter "**Goss**".

30. **As to claim 6:**

Rejection of claim 5 is incorporated, and further Ritchey, Microsoft, and

Augusteijn do not explicitly disclose wherein said Java macro instruction is generated only when said virtual machine determines that said Java macro instruction should replace said conventional sequence. However, Goss discloses catching repeated sections of code and replacing them with calls to a function which perform the same function (col. 24, lines 25-32), and thus, Goss discloses a determination being made whether a macro instruction should replace a sequence, given sequences of instructions are repeated.

One of ordinary skill in the art at the time of the applicant's invention would have been motivated to combine the teachings of Ritchey, Microsoft and Augusteijn with Goss because Goss discloses a further use of macros as an optimization technique that enhances the disclosure of Microsoft as to when else macros are used and why to create one. Therefore, it would have been obvious to create a macro if it is determined that the sequence of Ritchey is repeated, and because this optimization technique improves a program by making it smaller and/or run faster (col. 19, lines 39-42) as suggested by Goss.

31. As to claim 7:

Rejection of claim 6 is incorporated, and further Goss discloses wherein said determination is made based on a predetermined criteria (col. 24, line 27 "removing repeated sections").

32. As to claim 8:

Rejection of claim 7 is incorporated, and further Goss discloses wherein said predetermined criteria is whether said conventional sequence has been repeated more than a predetermined number of times (col. 24, lines 25-32, Goss implicitly discloses that the predetermined number of times is zero.).

33. **As to claim 18:**

Rejection of claim 17 is incorporated, and further see rejection of claim 6.

34. **As to claim 19:**

Rejection of claim 18 is incorporated, and further see rejection of claim 7.

35. **As to claim 20:**

Rejection of claim 19 is incorporated, and further see rejection of claim 8.

36. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ritchey and Microsoft as applied to claim 9 above, and further in view of Meyer et al. (Java Virtual Machine), hereafter "**Meyer**".

37. **As to claim 10:**

Rejection of claim 9 is incorporated, and further Ritchey does not explicitly state that the astore instruction it discloses is said inventive Astore instruction which operates to store values located on an execution stack into arrays, the virtual machine instruction

representing two or more Java Bytecode executable instructions that are also suitable for storing values located on an execution stack into an array. However, Meyer discloses an inventive Astore instruction which operates to store values located on an execution stack into arrays, the virtual machine instruction representing two or more Java Bytecode executable instructions that are also suitable for storing values located on an execution stack into an array (pg. 391, "Storing values in arrays... iastore... sastore" – Here shown are two or more Java bytecode executable astore instructions, any of which are suitable for storing values on an execution stack into an array, for which "the virtual machine instruction" or "inventive Astore instruction" may represent). It is unclear to the Office whether "the virtual machine instruction" refers to the "Java macro instruction" or the "inventive Astore instruction", however, the Office interprets "the virtual machine instruction" to refer to the "inventive Astore instruction".

It would have been obvious to one of ordinary skill in the art to include in the combination of Ritchey and Microsoft, the capability of various astore instructions as disclosed in Meyer, because Meyer teaches the enhancement of storing different types of values such as booleans, objects, shorts, doubles, and floating point values into arrays. This added enhancement would have been obvious to one of ordinary skill in the art at the time of the invention given these instructions are well known, i.e. commonly used, in the art as concluded from Meyer's disclosure.

38. **As to claim 11:**

Rejection of claim 10 is incorporated and further Meyer discloses wherein the

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arrays can be an array of 1 byte values, 2 byte values, 4 byte values, or 8 byte values (pg. 57 - shows "prefix codes for instructions" (prefix codes of astore instructions taught by Ritchey as seen in the rejection of claim 10) which represent the data types of the values that will be stored in the arrays; pg. 46 shows size of different data types of values that can be stored in arrays: 8 bits (1 byte), 16 bits (2 bytes), 32 bits (4 bytes), and 64 bits (8 bytes)).

39. As to claim 12:

Rejection of claim 11 is incorporated and further Meyer discloses wherein a header of an array is read to determine the type of the array (pg. 74 "Type Descriptors", pg. 75, Table 4-2 "array type descriptors" – An array type descriptors is interpreted to be a head of an array).

Conclusion

40. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Donovan et al. (U.S. Patent No. 6,072,951) teaches inlining one or more frequently executed paths providing a substantial improvement in speed of execution of a program by reducing procedure call overhead (Abstract and cols. 1-4).

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlene Gordon whose telephone number is (703) 605-4226. The examiner can normally be reached on Mon.-Fri. 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.G./C.M.

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